edibon

Engineering and Technical Teaching Equipment

Strain Gauge Training Unit

MEGE

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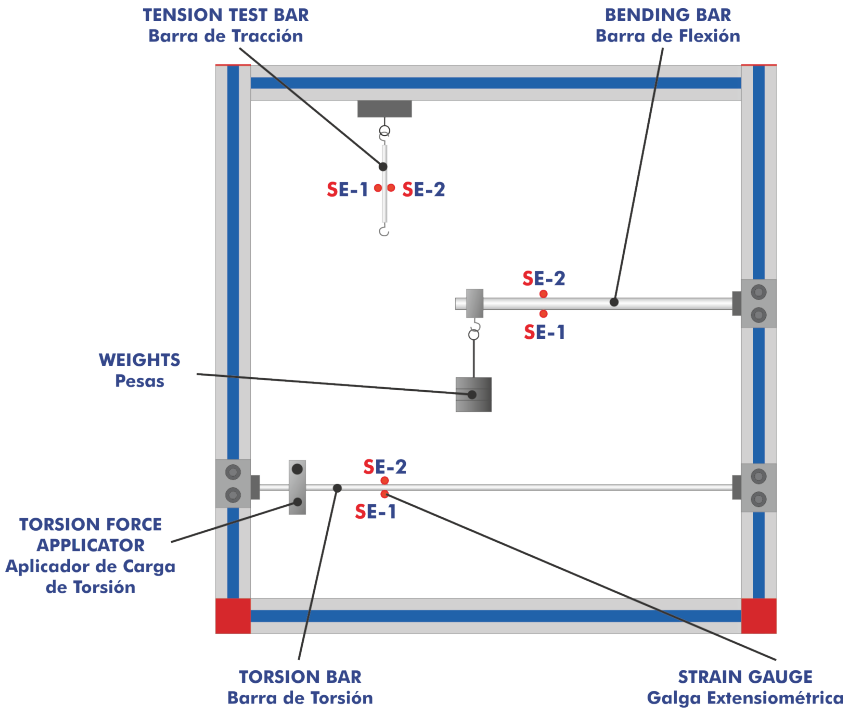
↳PRODUCTS
↳7.- MECHANICS AND 14.-BIOMEDICAL ENGINEERING

PROCESS DIAGRAM AND UNIT ELEMENTS ALLOCATION



Certificate of Approval of the Quality Management System

European Union Certificate (total safety)

UL and CSA Regulations (All our products are manufactured according to current UL and CSA regulations)

Certificate of Approval of the Environmental Management System

Worlddidac Association Certificate of Membership

INTRODUCTION

A strain gauge is a sensor that measures deformation, pressure, load, torque, position, etc. It is based on the piezoresistive effect, which is the property of certain materials to change the nominal value of their resistance when they are subjected to certain stresses, and it is deformed in the direction of the mechanical axes. A strain that deforms the gauge will produce a variation in its electrical resistance. This variation is produced by the change in length, the change originated in the section or the change generated in the resistivity.

They are used in different systems to detect deformations, forces and moments.

The Strain Gauge Training Unit, "MEGE", designed by EDIBON, studies the strain gauges and their application in the measurement of strain.

GENERAL DESCRIPTION

The Strain Gauge Training Unit, "MEGE", provides an introduction to the fundamentals of measurement with strain gauges, to compare how resistance strain gauges work and how they measure strains in different structures (torsion, tension and bending systems).

The unit consists of a frame, which allows to place several measuring specimens quickly and precisely.

Three test specimens (bars) for torsion, tension and bending are each fitted with four strain gauge measuring points. The bars are loaded incrementally, allowing for the strain reading to be monitored.

The strain gauges are inside a transparent cover that protects them and make them clearly visible for the visualization of the process.

The unit includes a set of weights, two weight holders to give each specimen (bar) a range of stress, and a console with an amplifier and a digital display to show all readings.

Three additional tension bars are available as accessories, made of aluminum, copper and brass, to determine the elasticity modulus (Poisson's ratio and Young's modulus) in the exercises.

SPECIFICATIONS

Bench-top unit.

Anodized aluminum frame and panels made of painted steel.

Main metallic elements made of stainless steel.

Diagram in the front panel with distribution of the elements similar to the real one.

Three strain gauge test specimens (bars), each with strain gauge measuring points:

Torsion test bar:

- Material: stainless steel.
- Length: 500 mm.
- Diameter: 10 mm.

Tension test bar:

- Material: stainless steel.
- Length: 200 mm.
- Cross-section: 0.5 x 25 mm.

Bending test bar:

- Material: stainless steel.
- Length: 400 mm.
- Cross-section: 4 x 25 mm.

The strain gauges are inside a transparent cover that protects them and make them clearly visible for the visualization of the process.

Set of weights:

10 x 0.5 N.

1 x 5 N.

2 x 10 N.

1 x 20 N.

Console:

Metallic box.

Main switch.

Switch to tare the deformation measurements.

Strain gauges connectors.

Digital display for the deformation measurement.

MEGE detail

Required elements Not included)

MEGE-A1. Tension test bar, aluminum.

MEGE-A2. Tension test bar, cooper

MEGE-A3. Tension test bar, brass

Manuals: This unit **is supplied whit the following manuals:** Required services, Assembly and Installation, Starting-up, Safety, Maintenance & Practices manuals.

EXERCISES AND PRACTICAL POSSIBILITIES

1.- Introduction to the fundamentals of measuring with strain gauges.
2.- Study of the strain gauges and application techniques.
3.- Study of the strain and stress in a torsion system.
4.- Study of the strain and stress in a tension system and the elasticity modulus (Poisson's ratio and Young's modulus).
5.- Study of the strain and stress in a bending system.
6.- Calculation of the mechanical deformations under torsion, tension and bending.
7.- Study of the correlation between mechanical strain and electrical resistance in a strain gauge.
8.- Study of the tensile strain and stress in different materials and comparison of the elasticity modulus (Poisson's ratio and Young's modulus) (additional recommended elements: "MEGE-A1", "MEGE-A2" and "MEGE-A3" are required).
9.- Comparison of different strain measurement systems and how they could measure force.

REQUIRED SERVICES

- Electrical supply: single-phase 200 VAC – 240 VAC/50 Hz or 110 VAC – 127 VAC/60 Hz.

DIMENSIONS AND WEIGHTS

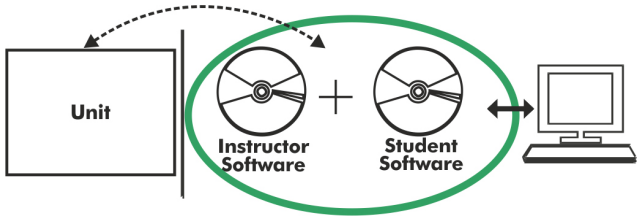
MEGE:
Unit:
- Dimensions: 600 x 400 x 650 mm approx.
(23.62 x 15.74 x 25.59 inches approx.)
- Weight: 20 kg approx.
(44 pounds approx.)

Electronic console:
- Dimensions: 300 x 190 x 130 mm approx.
(11.81 x 7.48 x 5.11 inches approx.)
- Weight: 2.5 kg approx.
(5.51 pounds approx.)

ADDITIONAL RECOMMENDED ELEMENTS (Not included)

- MEGE-A1. Tension test bar, aluminum.
- MEGE-A2. Tension test bar, cooper.
- MEGE-A3. Tension test bar, brass.

MEGE/ICAI. Interactive Computer Aided Instruction Software:



With no physical connection between unit and computer, **this complete software package consists of an Instructor Software (EDIBON Classroom Manager -ECM-SOF) totally integrated with the Student Software (EDIBON Student Labsoft -ESL-SOF)**. Both are interconnected so that the teacher knows at any moment what is the theoretical and practical knowledge of the students.

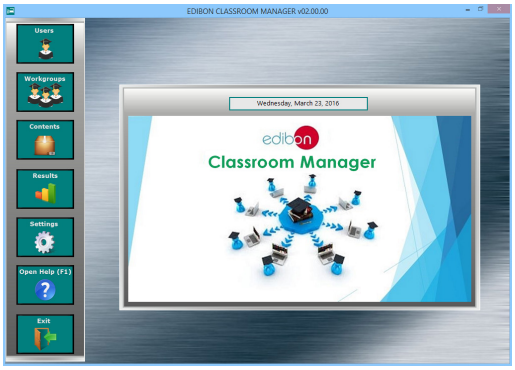
Instructor Software

- ECM-SOF. EDIBON Classroom Manager (Instructor Software).

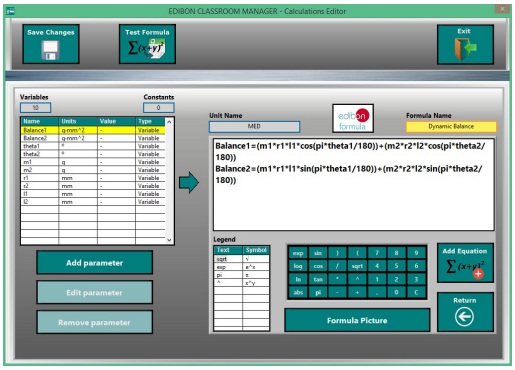
ECM-SOF is the application that allows the Instructor to register students, manage and assign tasks for workgroups, create own content to carry out Practical Exercises, choose one of the evaluation methods to check the Student knowledge and monitor the progression related to the planned tasks for individual students, workgroups, units, etc... so the teacher can know in real time the level of understanding of any student in the classroom.

Innovative features:

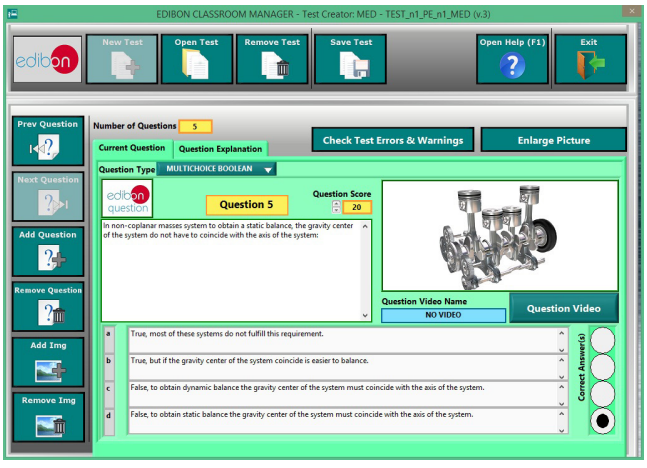
- **User Data Base Management.**
- **Administration and assignment of Workgroup, Task and Training sessions.**
- **Creation and Integration of Practical Exercises and Multimedia Resources.**
- **Custom Design of Evaluation Methods.**
- **Creation and assignment of Formulas & Equations.**
- **Equation System Solver Engine.**
- **Updatable Contents.**
- **Report generation, User Progression Monitoring and Statistics.**



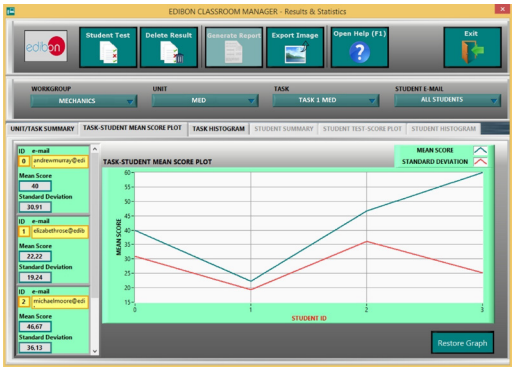
ECM-SOF. EDIBON Classroom Manager (Instructor Software) Application Main Screen



ECAL. EDIBON Calculations Program Package - Formula Editor Screen



ETTE. EDIBON Training Test & Exam Program Package - Main Screen with Numeric Result Question



ERS. EDIBON Results & Statistics Program Package - Student Scores Histogram

Optional

Student Software

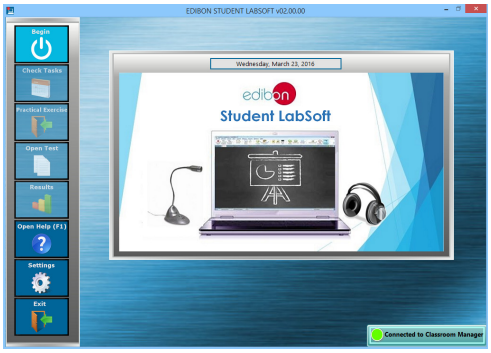
- ESL-SOF. EDIBON Student Labsoft (Student Software).

ESL-SOF is the application addressed to the Students that helps them to understand theoretical concepts by means of practical exercises and to prove their knowledge and progression by performing tests and calculations in addition to Multimedia Resources. Default planned tasks and an Open workgroup are provided by EDIBON to allow the students start working from the first session. Reports and statistics are available to know their progression at any time, as well as explanations for every exercise to reinforce the theoretically acquired technical knowledge.

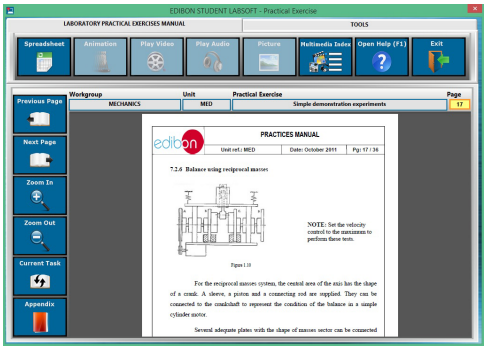
Innovative features:

- **Student Log-In & Self-Registration.**
- **Existing Tasks checking & Monitoring.**
- **Default contents & scheduled tasks available to be used from the first session.**
- **Practical Exercises accomplishment by following the Manual provided by EDIBON.**
- **Evaluation Methods to prove your knowledge and progression.**
- **Test self-correction.**
- **Calculations computing and plotting.**
- **Equation System Solver Engine.**
- **User Monitoring Learning & Printable Reports.**
- **Multimedia-Supported auxiliary resources.**

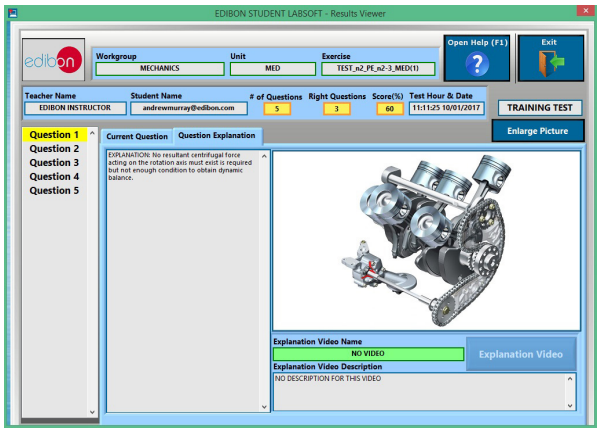
For more information see **ICAI** catalogue. Click on the following link:
www.edibon.com/en/interactive-computer-aided-instruction-software



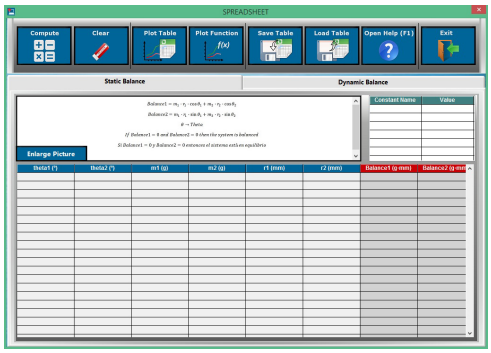
ESL-SOF. EDIBON Student LabSoft (Student Software) Application Main Screen



EPE. EDIBON Practical Exercise Program Package Main Screen



ERS. EDIBON Results & Statistics Program Package - Question Explanation



ECAL. EDIBON Calculations Program Package Main Screen

✱ Specifications subject to change without previous notice, due to the convenience of improvement of the product.

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REPRESENTATIVE: